June 10, 2008

Review of Final Report Draft "Metadata Guide for Salinity Data Sources for the Central Valley of California," by the California Water Institute, CSU Fresno

Reviewed by Steve Phillips, Research Hydrologist, US Geological Survey, Sacramento

General Comments

1. Although the Salinity Policy Group TAC was not involved in requesting, scoping, or overseeing this work, it is notable that the scope of work changed dramatically from development of a comprehensive web-accessible GIS-compatible database to written descriptions of existing databases. As such, this work represents a needed, but minor, step toward the end goal.

2. Perhaps this was not included in specifications for this work, but it is surprising that there is no mention of the availability of non-salinity data that will help to better understand the current distribution of salinity. For example, environmental tracers to estimate water age (e.g., tritium/helium, SF6, CFCs), and isotopes to estimate water sources will be important in the analysis and modeling of salinity data.

3. I am not an expert on sources of salinity data, so cannot comment on the thoroughness of this aspect of the report. However, I am reasonably well-versed in modeling tools and applications in the Central Valley, and the "Hydrological Models" section (7.2) is incomplete. As much as the report's positive descriptions and recommendations regarding MODFLOW and the FARM Process are appreciated, there are other codes with similar capabilities. Descriptions of the USGS codes were out of date – more recent information was sent to Dr. Suen to aid revisions.

4. The existence of a USGS model of the Central Valley, the ***Central Valley Hydrologic Model*** (CVHM), was not acknowledged in the "Hydrologic Models" section of the report despite having been presented to the TAC via presentation and PDF format. The CVHM incorporates the FARM Process, a detailed characterization of sediment texture, surface-water flow, ground-water/surface-water interactions, subsidence, and other key processes in the Central Valley at a finer resolution than the single valley-scale model mentioned in the report. A recent paper describing the CVHM was sent to Dr. Suen to aid revisions.

5. There are other regional-scale modeling efforts in the Central Valley by multiple parties not mentioned in the report. This, combined with oversights noted above, suggests that not enough research was done to determine what modeling tools are currently available, and what is in the pipeline. My colleagues and I were not contacted with regard to USGS modeling tools and applications.

Specific comments

1. Please change all occurrences of Michael Shulters as a contact for USGS databases to Sylvia Stork (svstork@usgs.gov or 916-278-3115).

2. The USGS NWIS database covers the entire US, not just Central Valley counties, which is unclear in table 2.1 and similar tables.

3. The "temporal distribution" graphs on several of the map figures could be improved by replacing "count" with something like "number of sites in ___ database" which would also make it clear that it is the number of sites, not analyses (which I assume is the case). The date axis labels, e.g. "[1981; 1981)" are rather odd.

4. The figures showing salinity data are all from single databases, are not comprehensive, and may therefore be misleading with regard to the spatial and temporal availability of these data. There is no text accompanying the figures, so their purpose is unclear and limitations are not expressed. If the purpose is simply to portray one way to look at the data, a single figure with explanatory text would suffice.

5. There is no table 3.# describing the surface-water component of the USGS NWIS database (chapter 3).

6. Pg 7-5 – it is stated that "*to simulate water flow of the entire Central Valley, a hydrogeology model (an accurate description of sedimentary layers) for the entire Central Valley is needed. Such information can only be obtained from thousands of well logs kept by DWR. Because the well log information is proprietary under state law, these data are unavailable unless the State Water Board can make special arrangements or obtain special permission to access the necessary data sources.*" The USGS has already obtained all of the well logs in the Central Valley from DWR, and we have used 85,000 of them to develop a 3-D valley-wide model of sediment texture. This serves as the basis for our Central Valley Hydrologic Model. Developing a stratigraphic model from these logs and other data would be a potential next step.